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A Resource-Based View Assessment of Big Data Analysis and Its Impact on Strategic Human Resources Quality Management Systems

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Abstract

Introduction: The study here aimed to assess the impact of big data on Strategic HR quality management from a resource-based view. In order to develop better knowledge regarding the topic, objectives have formed and questions have also been set in research.

Literature Review: In this chapter, authenticated articles and journals are gathered as the crucial resources to complete the information. In addition, to enhance the quality of research, relevant literature can find the best possible way to understand the research matter. The selected theoretical framework is associated with the analysis of big data and strategic human resource quality systems.

Methodology: In order to collect meaningful information in this study, a primary quantitative method was selected where a survey was conducted with 65 participants.

Findings and analysis: Collected information was analysed through the SPSS tool that helped in generating regression and descriptive values along with correlation values effectively. Each variable failed to share a strong interconnection with each other as the values are lower than the Pearson Correlation value of 0.8.

Discussion: A strategic administration paradigm known as "the Resource-Based View" or "RBV" contends that a company's competitive advantage originates from its valuable, rare, unique, and not replaceable (VRIN) materials.

Conclusion: It is evident from this that the study that follows is warranted given that using big data has become necessary for modern businesses to increase productivity.

Keywords: “Strategic human resource”, “Resource-based view”, Big data analysis, HRM, quality management, organisational success, risk mitigation

Introduction

Background

A strategic management paradigm known as "the Resource-Based View" or "RBV" contends that a business's edge over its rivals originates from its valuable, rare, unique, and not replaceable (VRIN) assets. Human Resources departments can employ "big data analytics" as a potent tool to help their management of quality systems achieve VRIN competencies (Wang, 2021). It is important to examine social media information and survey responses from staff in order to gauge engagement rates and pinpoint areas in need of development. The strategic management framework provided by RBV helps in acknowledging the way the resources of an institute can be utilised for the optimisation of business processes. In the context of HRM with quality, the use of RBV can improve competitive advantages for companies with the integration of the big data analysis process into it. According to, Garcia-Arroyo & Osca, (2021), big data can help in deriving the performances of employees and understanding their skill set and sentiments effectively which is a valuable tool for HR professionals. Identifying high performers, areas for developing proper skills and potential risks can be gathered by HR through the analysis of big data.

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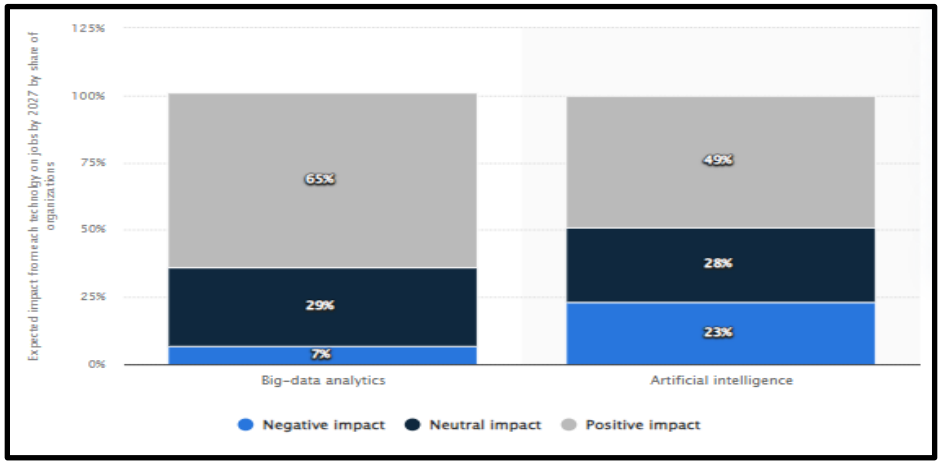

Figure 1: Impact of Big data analytics and AI in jobs across the globe
(Source: Statista, 2023)

Figure 1 here highlights the impact of utilisation of big data and AI in jobs across the globe from 2023 to 2027. 65% of companies worldwide reported that increment in job creation is possible through the use of AI in business while 7% added their fear of technology-based replacement in job markets (Statista, 2023). The overall growth of AI and Big data has potential in coming years. A maximum response depicts that these two have higher positive impact than negative. 23% explained technology can take jobs and 49% believe AI and big data can create more jobs (Statista, 2023).

Rationale

In the rapidly evolving business landscape in the current age, companies often face difficulties managing human resources for maintaining competitive advantages. The traditional HR management system lacks the agility required in the operations that fails to address all the emerging challenges (Oswald et al. 2020). Despite such difficulties, big data integration often comes as a potential challenge as the resources required for the process, mostly insufficient. The knowledge required among employees to handle data for the analysis to get reliable insight is not present adequately which limits the process of utilising big data in business. Besides that, infrastructure required for utilising Big Data analysis facilities is absent in many firms that hinder the successful implementation of it in HRM (Imran et al. 2021).

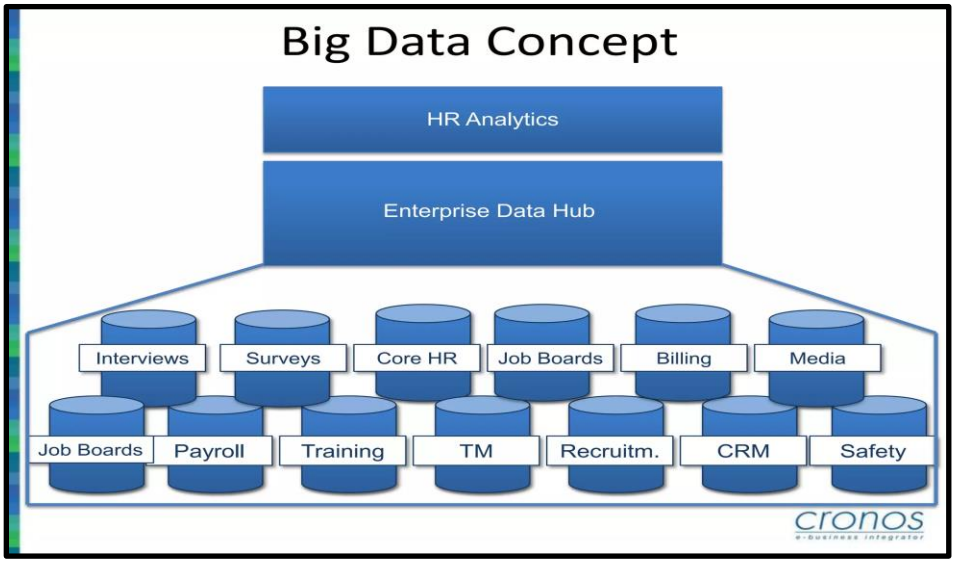

Figure 2: Role of Big data in HRM of companies

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(Source: Influenced by Oswald et al. 2020)

Aim

The aim of this study is to assess the impact of big data on Strategic HR quality management from a resource-based view.

Objectives

RO 1: To evaluate the role of Big Data analysis in the quality management of strategic HRM

RO 2: To discuss the key resources required in HRM for the successful utilisation of big data

RO 3: To discover the challenges, appear during the integration of big data analysis in HRM

RO 4: To recommend mitigation strategies for better optimisation of big data analytics for improved quality management in HR practices

Research Question

RQ 1: What is the role of Big Data analysis in the quality management of strategic HRM?

RQ 2: What are the key resources required in HRM for the successful utilisation of big data?

RQ 3: What challenges appear during the integration of big data analysis in HRM?

RQ 4: What mitigation strategies can be applied for better optimisation of big data analytics for improved quality management in HR practices?

Hypothesis

H 1: There is a string correlation seen to be forms between Quality HR management through Big Data analysis and Decision-making process

H 2: Optimising resources and Quality HR management through Big Data analysis has a positive correlation

H 3: Quality HR management through Big Data analysis shows a significant positive connection with Talent acquisition process

H4: A proactive linkage can be seen between Quality HR management through Big Data analysis and Mitigation of risk

Significance of the study

It is important to understand the way data needs to be viewed to consider as a strategic resource in the context of managing HR with quality. In order to acknowledge the proper way of developing capabilities for effective integration of the fanatics of Big Data in the existing HR systems in companies, this study can help in an effective way. This study helped in addressing all the challenges faced by companies to mitigate risk factors which can be useful for fellow researchers to gather relevant knowledge. Also, it can help HR professionals form companies to understand the way of leveraging insights from big data for the optimisation of HRM quality management process in a strategic way to increase the performance of companies.

Literature Review

Evaluating the “Big Data analysis's” contribution to the management of “strategic HRM quality”

The RBV methodology assists in determining how "big data analysis" can give the human resources procedures a VRIN edge. In the modern global talent market, having a more competent and motivated team is crucial for differentiation. The RBV method aids in determining which features of large quantities of data are most beneficial to HR (Malik et al. 2020). This maximises the benefit of investment or ROI by enabling targeted investments in hiring, training, data collecting, and analysis technologies. Businesses that use massive amounts of "data" for optimal human resources are demonstrating their dedication to evidence-driven making of decisions and a continual improvement mindset. This draws elite talent looking for chances to advance and improve in a cutthroat setting.

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The crucial roles of HRM resources needed for the effective use of "big data"

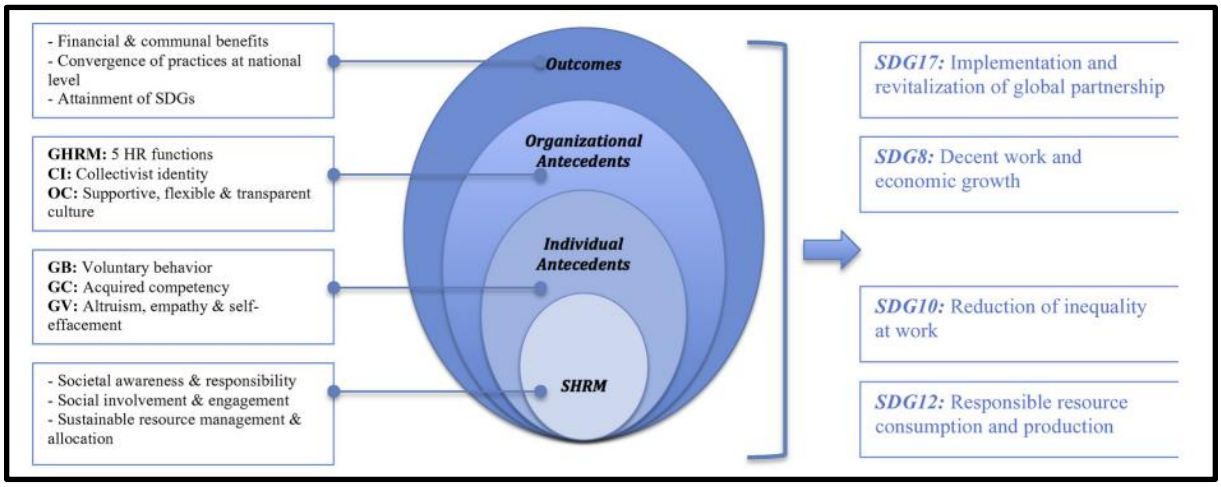

Figure 3: The integrated framework of SHRM
(Source: Dahlbom et al. 2020)

Big data has a lot of prospects for Human Resources, but to fully take advantage of it, certain HRM assets are required. As per the views of Malik et al. (2020), over the past 20 years, the management of knowledge and its utilisation for business advantage has grown in importance. Safety and confidentiality of data are crucial. In order to grow and carry out safe records-keeping procedures, HR needs experts. Ensuring adherence to pertinent data privacy laws, such as "the California Consumer Privacy Act" or "CCPA" and "the General Data Protection Regulation" or "GDPR" is crucial. Businesses can get a considerable edge by leveraging big data through smart HRM resource utilisation (Dubey et al. 2019). It makes it possible to oversee talent more strategically, perform better, and gain a market advantage. Investing in these tools shows that individuals are dedicated to creating a secure HR department that uses highly qualified employees and data-driven knowledge to promote company growth.

HR is now able to make "data-driven choices" about managing employees because of big data. This gives companies an advantage in a labour-intensive market by enabling them to draw in, hold on to, and nurture top talent.

Identifying the difficulties that arise when "big data analysis" is integrated into HRM

HR data can be inconsistent and inaccurately stored across many platforms. Data integration and sterilising from various sources take time, energy, and knowledge. It is possible that HR workers lack the data analytic abilities needed to understand complicated large data. It is essential to spend money on employing or instructing data researchers. Using big data might cause disruptions to current processes and give rise to worries about stability at work (Fenech et al. 2019). Biases that exist in previous data can be reinforced by big data techniques. HR is required to be conscious of these prejudices and take action to lessen them. Excessive reliance on statistics may result in a transactional method of HRM, where the human component of people management is subordinated to statistics. Striking the right equilibrium between encouraging a healthy work atmosphere and making decisions based on data is essential.

Because worker data is private, privacy issues arise when it is used for large-scale research. HR must make sure that appropriate compliance mechanisms are in effect to safeguard employee data while maximising its potential advantages. HR must have robust security procedures established to avert intrusions and be open and honest about the data that is gathered and the way it is utilised. Workers must have confidence that the information they provide is being managed appropriately, and companies must abide by data privacy laws. Lee & Ahmed, (2021) state that the original purpose of "the Internet of Things" aimed to provide global connectivity to a foundation for Internet access. Putting big data technologies into practice calls for a substantial financial commitment. The price of the equipment itself, the facilities required to store and process the information,

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and the qualified staff required to oversee it are all factors. The following can prove to be an enormous challenge, particularly for smaller businesses that might not have the funds or resources available for this kind of project.

Recommending mitigating tactics for enhancing "big data analytics" optimization for enhanced quality control in HR procedures

Establishing a robust data governance structure and promoting collaboration between the “HR and data analytics” units are essential. Although there are obstacles, big data has enormous possibilities for Human quality management. According to Collins, (2021), understanding how employee-oriented assets emerge at the organisational level is crucial to understanding how a CEO's flexible abilities determine the degree when a business-wide HR approach leads to higher employee-based materials. Organisations can have specific guidelines for collecting data, storing, accessing and utilising are established by a strong data governance structure. This guarantees the security of data, excellence and adherence to privacy laws. Ineffective governance can impede “quality control” efforts by causing inconsistent data, security, incidents and problems with trust among workers. Working together closes the knowledge discrepancy between the Human Resource grasp of business requirements and the information analysts’ proficiency with data analysis. This guarantees that HR uses information for “quality control” processes efficiently and raises the appropriate question.

Theoretical Framework

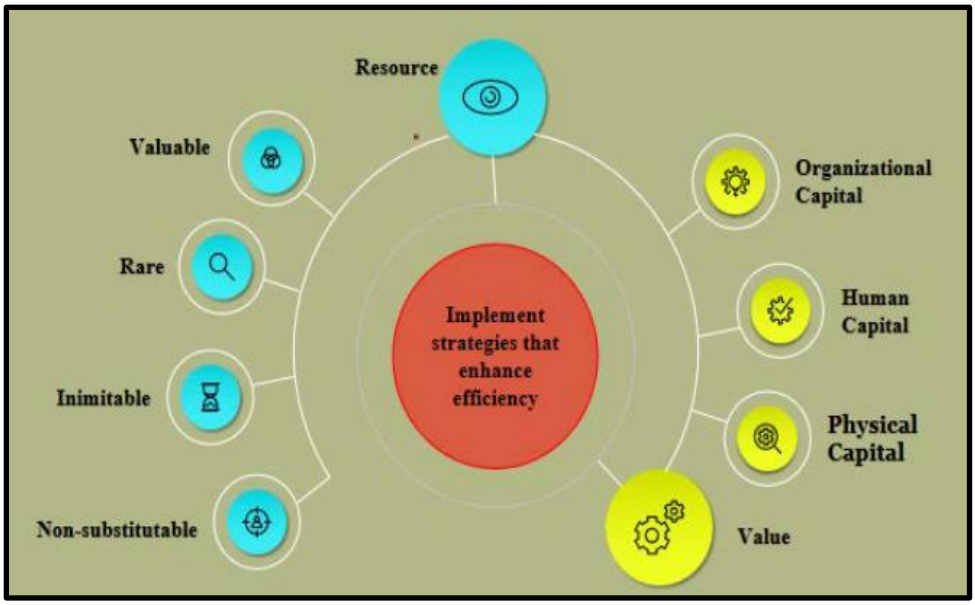

Figure 4: Resource-based view model
(Source: Rishi et al. 2022)

“The resource-based view” can be the most suitable theoretical framework for the chosen research topic to explain. HR may evaluate the strategic significance of actions instead of just measuring them by using an "RBV" in the eyes to analyse large data (Rishi et al. 2022). This guarantees that HR efforts support the firm's objectives and positively impact its performance.

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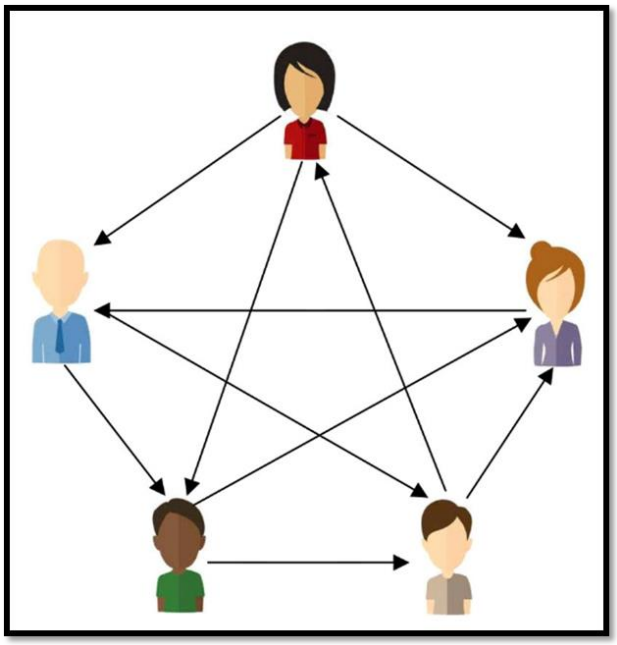

Figure 5: The graphic illustration of the model of "Social Network Analysis"
(Source: Liu et al. 2020)

Figure 3 shows the model of "Social Network Analysis". On the other hand, "***Social Network Analysis***" can be also utilised for the betterment of the selected research matter. The analysis of linkages and interconnections inside a company is the main goal of this framework (Liu et al. 2020). HR tactics for team development and skill pooling can be informed by the understanding of informal relationships and collaborative patterns that big data offers.

Literature gap

As per the views of Garcia-Arroyo & Osca, (2021), shows the reduced focus of suggestions for the selected research topic. In addition to adding strength, articles need to incorporate not only the concept but also challenges along with suitable recommendations. This is necessary for understanding the core issues in HR activities.

Methodology

Understanding the way big data can be viewed as a potential resource for the management of HR processes requires the collection of relevant information, thus, data collection plays a paramount role in this study. With the selection of deduction research approach, descriptive research design and interpretivism philosophy, the process of data collection can become easier. The collection of information needs to be done in such a manner that can help in increasing real-time knowledge regarding the topic. Thus, the study has selected a primary method where the qualitative process is able to be utilised for successful completion of the overall task. Through the use of primary quantitative methods, the view and perception of people can be gathered (Taherdoost, 2021). For the collection of information, a survey has been conducted for which 65 participants have been selected randomly. A questionnaire has also been prepared with 3 demographic questions and 10 topic-based questions. After the collection of information from the survey, SPSS software has been used to analyse the information to get adequate value. Through the collection of statistical information by using SPSS, generating results can be easier. In the analysis process, descriptive analysis has been done along with regression analysis to justify the hypothesises in this study.

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Findings and Analysis

Demographic analysis

Distribution of age

What is your age?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-35	24	36.9	36.9	36.9
	36-55	25	38.5	38.5	75.4
	56-70	8	12.3	12.3	87.7
	Above 70	8	12.3	12.3	100.0
	Total	65	100.0	100.0	

Table 1: Distribution of age

(Source: Primary data collected from SPSS)

Table 1 helped in understanding the age of selected participants in the survey. 25 people from the age group of 36-55 showed highest participation where 8 people participated from both the age group of 56-70 and above 70.

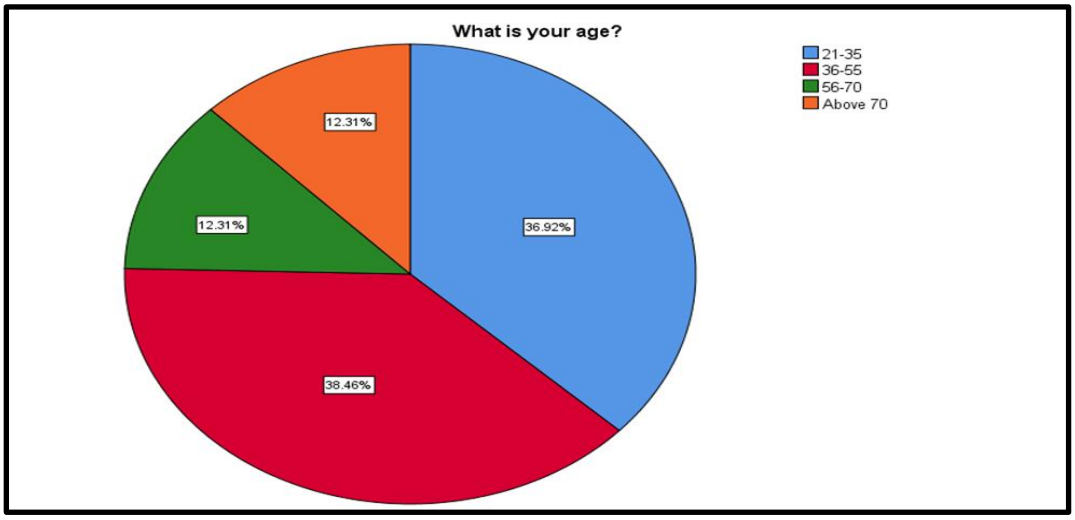

Figure 6: Distribution of age

(Source: Primary data collected from SPSS)

Percentage based age distribution of people participated in this research can be seen in Figure 6. 36.92% people from the age group of 36-55 shows highest participation where 12.31% people participated from both the age group of 56-70 and above 70.

What is your gender?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	32	49.2	49.2	49.2
	Male	17	26.2	26.2	75.4
	Preferred not to say	16	24.6	24.6	100.0
	Total	65	100.0	100.0	

Table 2: Distribution of Gender

(Source: Primary data collected from SPSS)

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Table 2 highlights the gender of participants where 32 were female and 17 were male. 16 participants preferred not to disclose their gender identity.

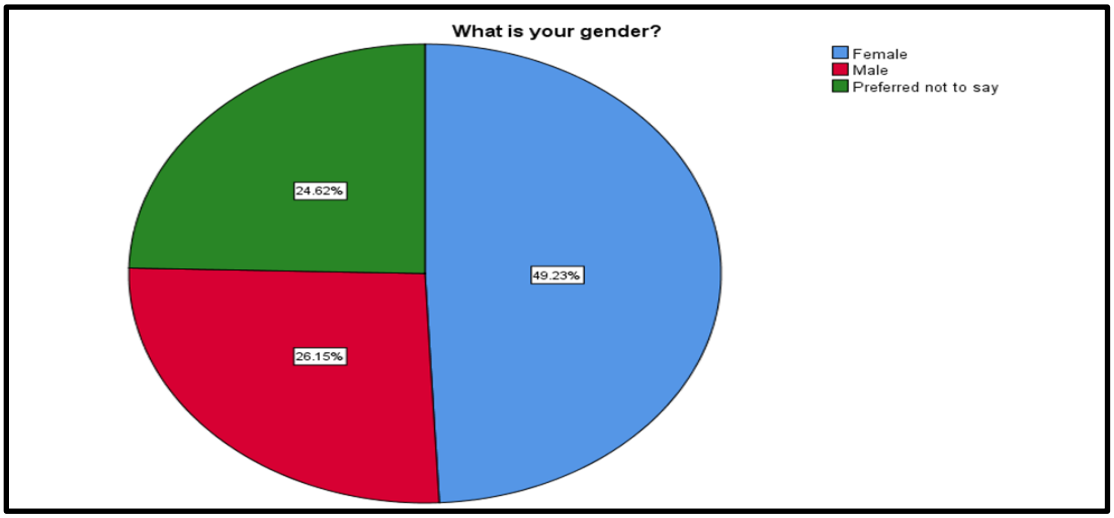

Figure 7: Distribution of Gender

(Source: Primary data collected from SPSS)

Percentage based distribution of gender of people participating in this research can be seen in Figure 7. 49.23% were female and 26.15% were male. 24.62% participants preferred not to disclose their gender identity.

What is your Income?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	25,000-35,000	8	12.3	12.3	12.3
	35,000-50,000	17	26.2	26.2	38.5
	50,000-75,000	32	49.2	49.2	87.7
	Above 70,000	8	12.3	12.3	100.0
	Total	65	100.0	100.0	

Table 3: Income range of the population

(Source: Primary data collected from SPSS)

Table 3 displays the income ranges of participants where 32 people belong to the income range of 50,000-70,000 which is the highest participation. 8 people belong to both the income group of 25,000-35,000 and Above 70,000.

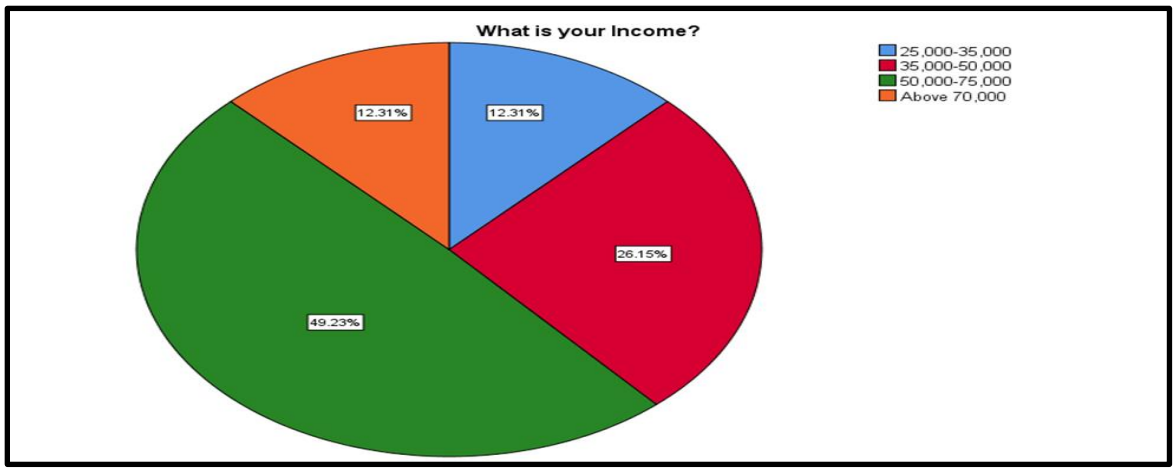

Figure 8: Income range of the population

(Source: Primary data collected from SPSS)

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Percentage based income ranges of people participated in this research can be seen in Figure 8. 49.23% people belong to the income range of 50,000-70,000 which is the highest participation. 12.31% people belong to both the income group of 25,000-35,000 and Above 70,000.

Descriptive analysis

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Quality HR management through Big Data analysis (DV)	65	1	5	3.46	1.359	-.630	.297	-.835	.586
Decision making process (IV1)	65	1	5	3.43	1.369	-.567	.297	-.939	.586
Optimising resources (IV2)	65	1	5	3.49	1.324	-.649	.297	-.729	.586
Talent acquisition process (IV3)	65	1	5	3.52	1.336	-.680	.297	-.721	.586
Mitigation of risk (IV4)	65	1	5	3.51	1.427	-.499	.297	-1.141	.586
Valid N (listwise)	65								

Table 4: Descriptive analysis

(Source: Primary data collected from SPSS)

Numerical value of collected information can be generated through descriptive analysis. Table 4 presented values of mean, median, and mode where the values of median ranges between 4 to 5 depicting, most participants selected agree and strongly agree respectively. The negative value of Kurtosis and Skewness depicts that thin and short tail on the right-hand side.

Regression analysis

Hypothesis 1

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.194[a]	.038	.022	1.343	.038	2.460	1	63	.122	2.357

a. Predictors: (Constant), Decision making process (IV1)
b. Dependent Variable: Quality HR management through Big Data analysis (DV)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.440	1	4.440	2.460	.122[b]
	Residual	113.714	63	1.805		
	Total	118.154	64			

a. Dependent Variable: Quality HR management through Big Data analysis (DV)
b. Predictors: (Constant), Decision making process (IV1)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.801	.453		6.189	.000
	Decision making process (IV1)	.192	.123	.194	1.568	.122

a. Dependent Variable: Quality HR management through Big Data analysis (DV)

Table 5: Linear regression of hypothesis 1

(Source: Primary data collected from SPSS)

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The value of R is 0.194 can be seen in Table 5 that depicts no strong linear relation forms between variables here. The value of Durbin-Watson is 2.357, depicting negative autocorrelation forms between IV1 and DV. Significance value is not less than 0.05 as it is 0.122, depicting the hypothesis 1 in this study has not accepted.

Hypothesis 2

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.128[a]	.016	.001	1.358	.016	1.054	1	63	.309	2.215

a. Predictors: (Constant), Optimising resources (IV2)
b. Dependent Variable: Quality HR management through Big Data analysis (DV)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.943	1	1.943	1.054	.309[b]
	Residual	116.211	63	1.845		
	Total	118.154	64			

a. Dependent Variable: Quality HR management through Big Data analysis (DV)
b. Predictors: (Constant), Optimising resources (IV2)

Coefficients[a]

Model		Unstandardized Coefficients: B	Unstandardized Coefficients: Std. Error	Standardized Coefficients: Beta	t	Sig.
1	(Constant)	3.921	.478		8.197	.000
	Optimising resources (IV2)	-.132	.128	-.128	-1.026	.309

a. Dependent Variable: Quality HR management through Big Data analysis (DV)

Table 6: Linear regression of Hypothesis 2

(Source: Primary data collected from SPSS)

The value of R is 0.128 can be seen in Table 6 that depicts no strong linear relation forms between variables here. The value of Durbin-Watson is 2.215, depicting negative autocorrelation forms between IV2 and DV. Significance value is not less than 0.05 as it is 0.309, depicting the hypothesis 2 in this study has not accepted.

Hypothesis 3

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.175[a]	.031	.015	1.348	.031	1.986	1	63	.164	2.249

a. Predictors: (Constant), Talent acquisition process (IV3)
b. Dependent Variable: Quality HR management through Big Data analysis (DV)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.611	1	3.611	1.986	.164[b]
	Residual	114.543	63	1.818		
	Total	118.154	64			

a. Dependent Variable: Quality HR management through Big Data analysis (DV)
b. Predictors: (Constant), Talent acquisition process (IV3)

Coefficients[a]

Model		Unstandardized Coefficients: B	Unstandardized Coefficients: Std. Error	Standardized Coefficients: Beta	t	Sig.
1	(Constant)	2.835	.475		5.970	.000
	Talent acquisition process (IV3)	.178	.126	.175	1.409	.164

a. Dependent Variable: Quality HR management through Big Data analysis (DV)

Table 7: Linear regression of hypothesis 3

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(Source: Primary data collected from SPSS)

The value of R is 0.175 can be seen in Table 7 that depicts no strong linear relation forms between variables here. The value of Durbin-Watson is 2.249, depicting negative autocorrelation forms between IV3 and DV. Significance value is not less than 0.05 as it is 0.164, depicting the hypothesis 3 in this study has not accepted.

Hypothesis 4

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.232[a]	.054	.039	1.332	.054	3.581	1	63	.063	2.430

a. Predictors: (Constant), Mitigation of risk (IV4)
b. Dependent Variable: Quality HR management through Big Data analysis (DV)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.355	1	6.355	3.581	.063[b]
	Residual	111.799	63	1.775		
	Total	118.154	64			

a. Dependent Variable: Quality HR management through Big Data analysis (DV)
b. Predictors: (Constant), Mitigation of risk (IV4)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.687	.442		6.085	.000
	Mitigation of risk (IV4)	.221	.117	.232	1.892	.063

a. Dependent Variable: Quality HR management through Big Data analysis (DV)

Table 8: Linear regression of hypothesis 4

(Source: Primary data collected from SPSS)

The value of R is 0.232 can be seen in Table 8 that depicts no strong linear relation forms between variables here. The value of Durbin-Watson is 2.430, depicting negative autocorrelation forms between IV1 and DV. Significance value is not less than 0.05 as it is 0.063, depicting the hypothesis 1 in this study has partially accepted.

Correlation Test

Correlations

		Quality HR management through Big Data analysis (DV)	Decision making process (IV1)	Optimising resources (IV2)	Talent acquisition process (IV3)	Mitigation of risk (IV4)
Quality HR management through Big Data analysis (DV)	Pearson Correlation	1	.194	-.128	.175	.232
	Sig. (2-tailed)		.122	.309	.164	.063
	N	65	65	65	65	65
Decision making process (IV1)	Pearson Correlation	.194	1	.200	-.168	.862**
	Sig. (2-tailed)	.122		.110	.181	.000
	N	65	65	65	65	65
Optimising resources (IV2)	Pearson Correlation	-.128	.200	1	-.077	.428**
	Sig. (2-tailed)	.309	.110		.541	.000
	N	65	65	65	65	65
Talent acquisition process (IV3)	Pearson Correlation	.175	-.168	-.077	1	-.027
	Sig. (2-tailed)	.164	.181	.541		.833
	N	65	65	65	65	65
Mitigation of risk (IV4)	Pearson Correlation	.232	.862**	.428**	-.027	1
	Sig. (2-tailed)	.063	.000	.000	.833	
	N	65	65	65	65	65

**. Correlation is significant at the 0.01 level (2-tailed).

Table 9: Pearson correlation analysis

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(Source: Primary data collected from SPSS)

Strength of the interconnection between variables can be observed through correlation analysis. The value of Pearson correlation needs to be lower than 0.8 which cannot be seen in any independent variables, depicting IVs failing to show a strong correlation with DV.

Discussion

According to Gerhart & Feng, (2021), the resource-based view theory has a direct connection with strategic human resources. It may prove challenging for rivals to mimic the development of a robust information culture within the SHR, proficiency in analysing data, and capability to convert findings into workable strategies, particularly if competitors absent the funding or cultural basis. Although individual data is intrinsically private, there are ethical concerns regarding employing it for enormous-scale research. Big data plays a crucial role in manufacturing, overseeing and commercial operations (Dubey et al. 2019). With the assistance of identifying the abilities and traits that indicate success inside the company, studying data can assist in identifying high-potential applicants. Better recruiting choices and employees with greater skills are the results of this. Analysis of big data will be viewed as a "VRIN resource" for SHRM "QMS" by using the lens of resources. After that, HR can create focused interventions to resolve worker complaints and raise spirits. HR can arrive at informed choices, streamline talent management procedures, and gain a major competitive edge by utilising big data effectively.

Conclusion

It can be concluded that the following research paper is justified as the requirement of the modern business arrives with big data usage to make stronger profitability. The whole research is segmented into five segments such as introduction, literature review, methodology, findings, discussions as well as conclusion. Maintaining a long-term strategy, big data projects in HR need to fall in line with the company's broader business goals. Getting managers and staff on board requires efficient communication and handling change techniques.

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